



**Bison Oil Well Cementing
Tail & Lead**

Date: 10/14/2018

Invoice # 200353

API#

Foreman: Kirk Kallhoff

Customer: Noble Energy Inc.

Well Name: Wells Ranch bb 09-639

County: Weld
State: Colorado

Sec: 8
Twp: 5N
Range: 62W

Consultant: jim
Rig Name & Number: H&P 321
Distance To Location: 27
Units On Location: 4028/4030/4024
Time Requested: 400 am
Time Arrived On Location: 130 am
Time Left Location:

WELL DATA	Cement Data
<p>Casing Size (in) : 9.625 Casing Weight (lb) : 36 Casing Depth (ft.) : 1,920 Total Depth (ft) : 1965 Open Hole Diameter (in) : 13.50 Conductor Length (ft) : 110 Conductor ID : 15.15 Shoe Joint Length (ft) : 37 Landing Joint (ft) : 35</p> <p>Sacks of Tail Requested: 100 HOC Tail (ft): 0</p> <p>One or the other, cannot have quantity in both</p> <p>Max Rate: 8 Max Pressure: 2500</p>	<p>Lead</p> <p>Cement Name: BFN III Cement Density (lb/gal) : 13.5 Cement Yield (cuft) : 1.68 Gallons Per Sack: 8.90 % Excess: 15%</p> <p>Tail Type III</p> <p>Cement Name: Cement Density (lb/gal) : 15.2 Cement Yield (cuft) : 1.27 Gallons Per Sack: 5.80 % Excess: 0%</p> <p>Fluid Ahead (bbls) 30.0 H2O Wash Up (bbis) 20.0</p> <p>Spacer Ahead Makeup 30 BBL ahead with Die in 2nd 10</p>

Casing ID 8.921 Casing Grade J-55 only used

Lead Calculated Results	Tail Calculated Results
HOC of Lead 1548.00 ft	Tail Cement Volume In Ann 127.00 cuft
Casing Depth - HOC Tail	(HOC Tail) X (OH Ann)
Volume of Lead Cement 756.55 cuft	Total Volume of Tail Cement 110.94 Cuft
HOC of Lead X Open Hole Ann	(HOC Tail X OH Ann) - (Shoe Length X Shoe Joint Ann)
Volume of Conductor 82.12 cuft	bbls of Tail Cement 22.62 bbls
(Conductor ID Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	(HOC of Tail) X (OH Ann) + (Cement Yield) X (Shoe Joint Ann) X (.1781) X (% Excess)
Total Volume of Lead Cement 838.68 cuft	HOC Tail 227.00 ft
(cuft of Lead Cement) + (Cuft of Conductor)	(Tail Cement Volume) ÷ (OH Ann)
bbls of Lead Cement 171.77 bbls	Sacks of Tail Cement 100.00 sk
(Total cuft of Lead Cement) X (.1781) X (1+%Lead Excess)	(Total Volume of Tail Cement) ÷ (Cement Yield)
Sacks of Lead Cement 574.09 sk	bbls of Tail Mix Water 13.81 bbls
(Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	(Sacks of Tail Cement X Gallons Per Sack) ÷ 42
bbls of Lead Mix Water 121.65 bbls	Pressure of cement in annulus
(Sacks Needed) X (Gallons Per Sack) ÷ 42	Hydrostatic Pressure 585.23 PSI
Displacement 148.26 bbls	
(Casing ID Squared) X (.0009714) X (Casing Depth) + (Landing Joint) - (Shoe Length)	
Total Water Needed: 333.72 bbls	Collapse PSI: 2020.00 psi
	Burst PSI: 3520.00 psi

X Authorization To Proceed

Customers hereby acknowledges and specifically agrees to the terms and condition on this work order, including, without limitation, the provisions on this work order.



**Bison Oil Well Cementing
Two Cement Surface Pipe**

Date

10/14/2018

INVOICE #

200353

LOCATION

Weld

FOREMAN

Kirk Kallhoff

Customer
Well Name

Noble Energy Inc.
Wells Ranch bb 09-639

Treatment Report Page 2

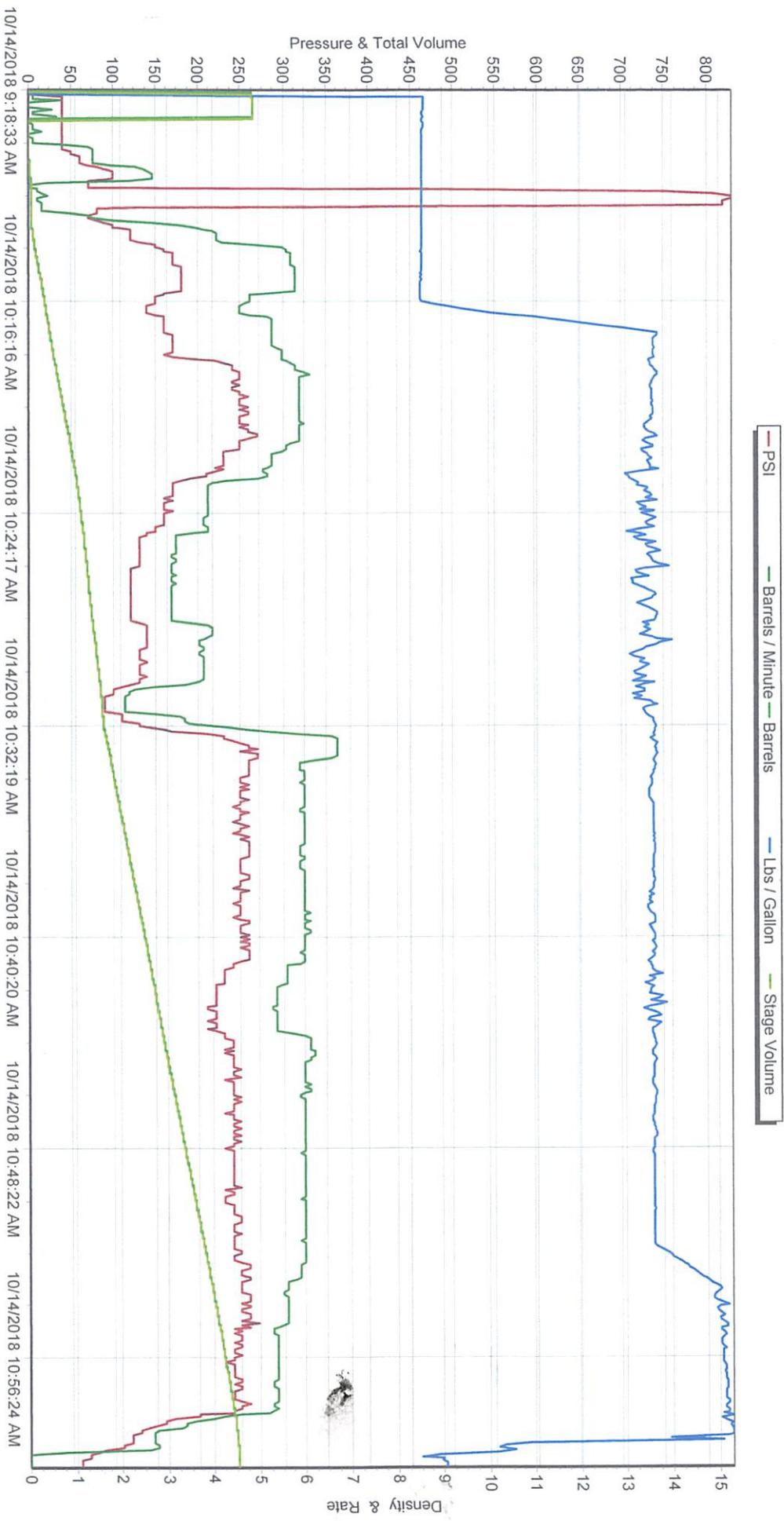
Amount Pumped	Time	Event	Description	Rate	BBLs	Pressure
Lead mixed bbls	121.6	130 am	ARRIVE ON LOCATION			
Lead % Excess	15%	905 am	JSA			
Lead Sacks	574	937 am	JSA			
		1010 am	PRESSURE TEST			1500
		1012 am	SPACER AHEAD	6	30	200
Tail mixed bbls	13.81	1018 am	LEAD CEMENT	6	171.7	210
Tail % Excess	0%	1053 am	TAIL CEMENT	6	22.6	180
Tail Sacks	100	1100 am	SHUT DOWN			
		1104 am	DROP PLUG			
Total Sacks	674	1105 am	DISPLACEMENT	8	148.2	350
Water Temp	60	1137 am	Bump Plug	2	148.2	630
bbl Returns	34	1137 am	Casing TEST			1060
		1152 am	Check Floats			
Notes:		1230 pm	RIG DOWN			
Montered well for 30 Min. No top out Needed		100 pm	Leave Location			

X *[Signature]*
Work Performed

X CO MAN
Title

X 10-14-18
Date

SERIES 2000



10/14/2018
